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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,800	09/28/2000	Bulent M. Basol	2022/48819	7925

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EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/671,800

Applicant(s)

BASOL ET AL.

Examiner

William T. Leader

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 93-101 is/are pending in the application.
- 4a) Of the above claim(s) 97-99 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 93-96, 100, 101 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Receipt of the response filed on October 22, 2003, is acknowledged. Applicant has elected species "I" and identified claims 93-96, 100 and 101 as readable on the elected species. Claims 97-99 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 93-96, 100 and 101 are rejected under 35 U.S.C. 102(e) as being anticipated by Mayer et al (6,315,883).

3. The Mayer et al patent is directed to the metalization of integrated circuits (column 1, lines 22-30). The device includes a planar conductive material structure of the type recited in the instant claims. On a semiconductor wafer substrate a plurality of layers are formed. The upper layers 201 are shown in figure 2. These include a patterned dielectric layer 203. This layer has a top portion that includes a surface portion and a cavity portion. The cavity portion has at least a first cavity

205 and a second cavity 207. A planar conductive layer is formed within the cavity portion and on the surface portion as shown in figures 3-8. These figures show the same configuration of surface and cavities as in figure 5 of the application. Instant claim 93 further recites that the thickness range of the planar conductive layer over the surface portion is between one tenth and one half of the thickness of the planar conductive layer within the cavity portion. Mayer et al disclose that cavity features may have an aspect ratio (which is the ratio of depth to width) of greater than 3:1 (column 2, lines 25-29). Mayer et al further disclose that metalization thickness of one half the feature width is needed to close the cleft over the feature (column 2, lines 31-32). Thus, Mayer et al teach that the metalization thickness over the surface is at least half the width of the feature which was previously given as about one third of the depth. Combining these two numerical expressions, Mayer et al teach that the thickness of the metalization over the surface portion is one sixth of the thickness within the cavity portion (width of cavity = $1/3$ depth of cavity; metalization on surface = $1/2$ of metalization in cavity, i.e. depth of cavity; thus, thickness of metalization on surface = $1/6$ of thickness of metalization in cavity). One sixth falls within the range of one tenth and one half recited in instant claim 93. Thus, Mayer et al disclose all features recited in claim 93.

4. With respect to claim 94, Mayer et al disclose that the widths of features may range from $0.2\text{ }\mu\text{m}$ to $100\text{ }\mu\text{m}$ (column 2, lines 41-45). The widths recited in claim 94

fall within the range recites by Mayer et al. With respect to claim 96, Mayer et al disclose the formation of barrier layer 209 over patterned insulating dielectric layer 203. With respect to claims 96 and 101, Mayer et al disclose that the preferred material for the conductive layer is copper or an alloy of copper (column 4, lines 19-20). With respect to claim 100, Mayer et al indicate that the process is directed to the formation of integrated circuits (column 1, lines 22-30).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35

U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 93-96, 100 and 101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayer et al (6,315,883).

8. The Mayer et al patent is taken as above. Should Mayer et al be interpreted as not specifically disclosing the range recited in instant claim 93, the choice of thickness of the conductive material with respect to the dimensions of the cavities would have been obvious to one of ordinary skill in the art because Mayer et al typical values for cavity sizes and explain that the thickness of the deposited conductive layer should be sufficient to close the cleft above the cavities (column 2, lines 31-34). The prior art of record is indicative of the level of one of ordinary skill in the art. Choice of values from within the ranges disclosed by Mayer et al would have been at least obvious to one of ordinary skill.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 703-252-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 703-252-1244.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


William Leader
January 5, 2003

ROY KING 
SUPERVISORY PATENT
TECHNOLOGY GROUP